



## Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact [support@jstor.org](mailto:support@jstor.org).

*Journal of the Society of Arts.*

FRIDAY, OCTOBER 4, 1861.

INTERNATIONAL EXHIBITION OF  
1862.

The Council beg to announce that the Guarantee Deed is now lying at the Society's House for signature, and they will be much obliged if those gentlemen who have given in their names as Guarantors, will make it convenient to call there and attach their signatures to the Document. Signatures for sums amounting in the aggregate to £431,700, have been attached to the Deed.

## WEEKLY PROGRESS OF THE INTERNATIONAL EXHIBITION.

It will be interesting, probably, to the Members of the Society to have a short notice weekly of the progress of the building and the general arrangements for the Exhibition, and it is intended to furnish one, bringing up the facts to every Wednesday morning.

Five months ago the area at the southern extremity of the Horticultural Gardens was an open field; already the enormous space of about 22 acres, is more or less covered. The chaotic masses of timber and iron which periodically litter the ground rapidly melt away, while column rising on column, and joist upon joist, tell the tale of their consumption. A sufficient portion of the building is completed to realize fully the general plan as well as the proportions.

The pillars of the nave with the adjoining galleries are raised throughout its entire length, and at the eastern end seven ribs of the roof and seven windows of the clerestory are erected; three ribs of the roof are fixed on the eastern transept. The galleries also are being pushed forward, and mark the position of the glass courts. The southern picture gallery is completed to the roof line, and fourteen principals of the roof are fixed, being half the whole required.

Perhaps the most novel and interesting portion of the works at present consists of scaffolding. That intended for the erection of the eastern dome is finished to the height of 180 feet, and is probably the largest timber scaffold ever erected in this country. It consists of about 30,000 cubic feet of timber piled up in eight stories. The corresponding scaffold at the other end of the nave is nearly half done.

In order to raise the ribs of the nave, a travelling scaffold has been erected, to move on a tram throughout its entire length. This beautiful piece of workmanship is about 95 feet high, and has cost the contractors the sum of £500 at least. Notwithstanding its size and weight, it can be

run along the tram by four men. To prevent the tramway from being driven into the earth by the superincumbent structure, it has been found necessary to drive piles for it to rest on.

The Machinery Shed, in Prince Albert's-road, is in a very forward state. It consists of four aisles, lighted from the top, and presents a noble picture of elegance and lightness, with rather a Gothic look given by the intersection of the circular ribs. The cheapness of the cost of its production is a no less remarkable feature of its construction, and offers a useful suggestion for any temporary buildings, or for those intended for agricultural purposes.

In the meantime, the arrangements for the Exhibition itself are progressing quickly and favourably.

The 30th of September was the last day on which applications for space were received. The total number of applicants from Great Britain and Ireland amounts, speaking roughly, to 10,000, and, as might be expected, a very large number of these have only come forward at the last moment. On Friday, the 27th, 200 applications came in; on Saturday, 300; on Monday, 500; and on Tuesday, the last day, nearly 600.

Foreign countries are expected to notify to H.M.'s Commissioners the manner in which they will utilize the space allotted to them, on or before the 1st of November, soon after which period the position of the different countries in the building will be fixed. As at present proposed, the machinery of all countries will be exhibited together. So also Photography and Education will form international exhibitions.

Some amount of dissatisfaction has been expressed by all the large countries on the Continent at the smallness of the space placed at their disposal, and they point to the much larger space which they occupied in Paris in 1855, as a claim for an increase on that allotted to them on this occasion. It should be remembered, however, that H.M.'s Commissioners are unable to accept the Paris Exhibition as a precedent; practically the extent of ground at the command of the French Commissioners in 1855, as well as the funds provided by an Imperial Government, were unlimited; the area occupied by H.M.'s Commissioners in 1862 is not susceptible of extension, and the capital is the result of the private liberality of a thousand guarantors animated only by public spirit. Speaking generally, and considering the space to be reserved for ceremonials and passages, the whole space available for the actual exhibition of works of industry will be scarcely, if at all, larger than that occupied in 1851.

The following arrangements have been made since the last announcement:—

## EAST INDIES.

The Government of India have authorised the expen

diture of one lac of rupees in furtherance of the Exhibition. This sum will be administered by the local committees appointed at the seat of Government of each of the provinces of India, who are actively engaged in carrying out the various measures that will be necessary to secure an efficient representation of the industrial resources of Her Majesty's Eastern empire.

#### UNITED STATES OF AMERICA.

H.M. Commissioners for the Exhibition of 1862 have received a communication stating that a Commission has been appointed to represent the interests of exhibitors from the United States of America in the coming Exhibition, consisting of the Hon. William H. Seward, Secretary of State, the Hon. Edward Everett, and several other distinguished gentlemen.

Commissions have also been appointed at the under-mentioned Colonies:—

#### BARBADOES.

Stephen Cave, Esq., M.P., 62, Threadneedle-street, London, Commissioner.

#### BERMUDA.

His Excellency the Lieut.-Governor, *President*.  
Henry Frederick Plow, Esq., Honorary Secretary.

#### NOVA SCOTIA.

The Hon. Joseph Howe, *Chairman*.  
R. G. Halliburton, Esq., Secretary.

#### PRINCE EDWARD'S ISLAND.

H. Haszard, Esq., Charlotte-town, Secretary.

The Paris correspondent of the *Times* states:—"The Imperial Commission for preparing the French part of the Universal Exhibition at London has just issued another circular, in which it announces that it cannot attend to any applications for permission to exhibit which have reached it since the 15th of this month, except, however, for grave reasons of general interest, such as a new discovery, or the making up of a deficiency in any part of the French Exhibition. The rest of the document is taken up with a description of the Exhibition Palace now in course of construction in London. The Commission states that the total surface presented by the building and its annexes will be 108,203 square metres, of which 82,195 in the building, and 15,684 in the annexes, are set apart for manufactured productions, 7,210 in the building for fine arts, and 3,114 also in the building for buffets. At Paris, in 1855, the total surface was 168,202 square metres—manufactures occupying 56,007 in the Palace, and 74,359 in the annexes, fine arts 16,150 in the annexes, the rest being set apart for buffets."

### THE BRITISH COLONIES AND THE INTERNATIONAL EXHIBITION.

By P. L. SIMMONDS.

#### NO. V.—THE AUSTRALIAN COLONIES.

I endeavoured to show in the last number of the *Journal*, by carefully prepared tables and figures derived from official documents, the remarkable progress which the Australian colonies have made in the last ten years; and the altered relation in which they will stand before the British and European public next year, to what they held in 1851. These figures, and the deductions drawn from them, could not fail to surprise many who had formed but a vague notion of the agricultural and commercial progress and material wealth of our great Australian Empire—an aggregation of important States, rivalling in progress the advance of either the African, West Indian, or North American groups of colonies.

That the Australian colonies in general will be creditably represented here next year, there can be no doubt

whatever, judging from the notes of preparation, the systematic manner in which the colonial arrangements are being carried out, and the active exertions that are making in all quarters. Victoria, Tasmania, New South Wales, Queensland, and Western Australia have all received liberal colonial grants for carrying out the object. South Australia, on the contrary, has elected to depend solely upon individual contributions. The sums voted by the several legislatures, in the aggregate exceeding £20,000, aided by private liberality and individual effort, will go far to make up a most creditable display, and the Australian courts at South Kensington bid fair to be among the most attractive of the colonial displays in the great building.

There are many points in which the Australian colonies are sure to be well represented. The main staples of wool, building woods, minerals, and even wines from some localities, will be certain to receive due attention; but I trust to see secondary articles also sent forward, for some of these are very likely to become of commercial importance hereafter. There are many ornamental woods, for instance, admirably suited for cabinet work, which only require to be seen and examined to be duly appreciated.

The earth is now being ransacked for new fibrous substances for making paper, millboard, cordage, &c., for which purposes some of the barks of Australian trees, and the fibrous materials of many of the native plants are, perhaps, well calculated. The extension of the manufacture of papier maché has created a great demand for all iridescent shells, and many of those common on the Australian shores might possibly, if exhibited, be found suitable for this or some other profitable use. The fashion of wearing ornamental feathers may possibly also bring into use those of many of the beautiful land and aquatic birds of Australia and Tasmania, which are scarcely known at present in England. The skins of the fur-bearing animals may be exhibited with the greatest advantage.

Examples of the alpacas and mohairs of Australian growth, and manufactures therefrom will be sent. Silk, too, is an industrial product in which we should like to see some progress made. Many tropical fruits and plants have been successfully introduced into Australia, and these should be shown either by wax models, in spirits, or in some other form, in order to convey a correct idea of the range of climate and producing capabilities of the country.

Investigations seem hitherto not to have pointed out any important dye-plants indigenous to Australia, although it may be presumed that some of the various colonial woods and herbs may yield such. The wattle bark is employed locally in all the tanneries, and, previous to the Australian gold era, formed an article of export to the English market. The gum resin of the *Eucalypti* is also employed for tanning. For investigations into the medicinal properties of plants in Australia a wide field is still open. More attention should be directed to the circumstance, that all the myrtaceous plants, which, throughout Australia, constitute the main part of the timber, and generally also of the scrub vegetation, yield, in a greater or smaller degree, an essential oil. Unlimited quantities of *Eucalyptus* and *Melaleuca* leaves might be turned to account by the simple process by which, in India, the cajeput oil is obtained.

Paintings, photographs, and views of the scenery, buildings, &c., of the colonies should especially be sent, as these have a particular attraction for intending emigrants and those who have friends settled there, and will convey a truthful picture of the actual condition of the colony.

The literature of Australia should also be duly and creditably represented, and this branch of progress will compare satisfactorily with that of any of the British colonies, either as regards periodical literature, newspapers, magazines, and almanacks, or even works of colonial origin printed in the mother country. The newspaper literature of Australia and New Zealand will compete creditably, whether as regards typography or subject matter, with that of any other British dependency, and is, indeed, far in advance of that of British North America,

the West Indies, or South Africa. A collection of specimens of the existing newspapers will also prove of great interest both now and hereafter. I may state, indeed, without fear of contradiction, that the art of printing has been carried to a perfection in many of the Australian colonies that will bear comparison with the finest work emanating from the London press.

The Australian Colonies generally are likely to be so well and fully represented, that it is impossible to do justice to the industry and diligence of all in a mere abstract in one *Journal*. I must, therefore, take them *seriatim*, commencing with the oldest.

#### NEW SOUTH WALES.

His Excellency the Administrator of the Government, with the advice of the Executive Council, has appointed a Commission, consisting of the undermentioned gentlemen, to advise and carry out the details necessary to facilitate the transmission to London of articles the produce or manufacture of New South Wales, and adequately representing the resources of the colony.

The Hon. T. A. Murray, Speaker of the Legislative Assembly; Sir Chas. Nicholson, Bart.; Sir Wm. Macarthur, Kt.; the Hon. R. J. Want, Member of the Legislative Council; A. W. Scott, Member of the Assembly; Capt. E. W. Ward, R.E., Deputy-Master of the Royal Mint; the Rev. W. B. Clarke, M.A.; John Campbell, Chas. Kemp, and Thos. S. Mort, Esqrs.

A sum of £3,000 has been voted by the legislature, and placed at the disposal of the Commission; and a further sum of £5,000 for the purchase of gold specimens, to be repaid after the sale of the gold. The Commission charges itself with defraying the cost of articles intended for exhibition, to Sydney and all subsequent expenses connected with storage; the conveyance to London; the repacking and reconveyance (if desired) of the respective objects back to the Colony. The specimens to be selected, it is pointed out, without being too bulky, should be of the choicest character and as varied as possible, and they are to be more particularly illustrative of objects, the sources of present wealth and prosperity, or of indigenous products which there is a reasonable presumption may hereafter prove to be of economic value or of commercial importance.

The Commissioners have published and circulated, for general information, their scheme for carrying out the intentions of the Government. They have also formed themselves into committees for the better execution of their design. It is proposed to recognise meritorious contributions and those who may actively co-operate with the Commissioners, by the local presentation, as prizes, of silver and bronze medals.

The animal products intended to be sent are wool, silk, feathers, skin, horns, hair, preserved meats, cheese, tallow, animal oils, manures, whalebone, tortoiseshell, pearls, corals, and other articles. It is contemplated sending wool in very diminutive bales, and exhibiting whole fleeces so far as possible.

Messrs. T. S. Mort and Co., of Sydney, have invited the wool growers of the colony to send in samples of the present year's clip, to compete for three gold medals, and afterwards to be forwarded, through the Colonial Commissioners, to the International Exhibition. The same firm has notified its intention to offer two gold medals for the first and second best samples of cotton, the produce of New South Wales. Local prizes are offered by the Government for the best six fleeces of wool in the grease, for the best six washed on the sheep's back, and for the best samples of scoured sheep's wool (12 lbs.) Letters have been addressed to several gentlemen calling on them to contribute skins of the sugar squirrel, wallaby, platypus, grebe, and lyre bird.

But one of the principal, if not the most interesting, of the New South Wales exhibits will be a collection of stuffed skins, showing the various successful crosses of that valuable animal, the alpaca. The necessary authority having been given by the Government, Mr. C. Ledger pur-

poses killing nine animals, from the increase of the flock since their arrival in the colony, the skins of which are to be carefully stuffed and set up, in order to show the quality of the fleece, and also the results which have accrued from systematic and judicious crossing or in breeding. The tallow or lard taken from the animals (and which, we believe, has valuable medicinal properties) is also to be forwarded in glass jars for the inspection of those who may feel interested in the matter, while an opinion on the quality and nutritious properties of the flesh is to be elicited by means of a distribution of venison to the different clubs of Sydney, and to such private individuals as may be desirous of giving a qualified opinion on the point. In his letter to the Commissioners, wherein he suggests the propriety of such an exhibition, after alluding to the comparatively small cost which it would entail, Mr. Ledger says:—"This would in all probability be covered by the sale of the specimens in London. I entertain no doubt but that they would command a high price, not only from the fact of their being the indication of a new source of valuable export from this colony, but for demonstrating the fallacy of hitherto erroneously advanced theory as to the sterility of the cross breedings of this animal. Hybridization assumes through them a complete change. The 'savans' will see that they have been in error for a very long period; and, moreover, the collection will be the first ever exhibited of the 'Auchenia' in its varied crosses, and will be worthy a place in the National Museum."

As a new and prospectively important source of productive wealth, the alpaca enterprise in the International Exhibition will be a great attraction. The specimens will show the several crosses, six in number, each successive cross losing the characteristics of the llama, and approaching the pure alpaca so closely, that in the last stage the fleece can only by practised eyes be distinguished from that of the pure alpaca. Only one animal representing the latter class will be slaughtered; the other animals would not be serviceable for breeding, so that the loss of the animals will not be felt. It is suggested that the specimens should, at the Exhibition, be grouped in a circle, commencing with the male alpaca and the female llama, exhibiting the gradual improvement of the fleece, the sixth cross being a scarcely perceptible remove from the pure alpaca. The specimens will prove the success that has attended both the acclimatisation of the alpaca in Australia, and also the cross breeding which Mr. Ledger has been conducting. The group will, no doubt, form an object of great interest in the New South Wales Department of the Exhibition, especially to those who are alive to the value of the alpaca fleece for manufacturing purposes.

Mr. Ledger has recently received intimation of a first-class gold medal having been awarded by the Société Impériale Zoologique d'Acclimation de Paris, as a testimonial of his services as a "universal benefactor" in the introduction of alpacas into Australia.

The vegetable products that will be sent from New South Wales are wheat and other cereals, seeds and pulses, coffee, cotton, tobacco, hops, dried and preserved fruits, pickles, arrowroot, starch, sugar, ginger, gums and resins, vegetable oils, fixed and volatile, medicinal substances, woods, barks, dye stuffs, tanning substances, and vegetable fibre, suitable for cordage or paper. The woods are to be represented, first, by pieces about 5 feet long by 2½ inches square in section, for testing, if desired; secondly, by blocks of 9 inches, or one foot cube of wood fit for cabinet work, and thirdly, by the largest timber obtainable from trees of known value for timber. Eighty-seven specimens of the woods of this colony and Queensland have recently been tested at the Sydney Mint, with a view to the determination of their relative degrees of strength and elasticity. Many of them prove to be superior in both respects to the oak, the ash, and the best woods of Great Britain. An extensive forest of the very best cedar has recently been discovered on the Clarence river.

Mr. Moore, the Director of the Sydney Botanic Gardens,

has been collecting woods and other botanic specimens in the Clarence and Richmond River District.

The Mineral Products Committee have solicited contributions from several quarters, among others from the following companies and individuals:—The Sumner-hill Mine, the Ophir and Canabolas Mine, the Carangara Mine, the Coal and Copper Co.'s Mine, requesting them to furnish specimens of all the different ores found in those mines, and of the rocks most prevalent, with, if possible, plans and sections showing the working of each mine;—to Mr. Arthur Hodgson, General Superintendent of the Australian Agricultural Co.'s Coal Mines, to Mr. Moorar, Commissioner of Crown Lands at Tamworth (asking him to forward marble and limestone), and to others.

The Committee have also communicated with the Commissioners of the Gold Fields, requesting them to furnish a sample of not less than six ounces in weight from each alluvial gold field in the district under their charge. There are about fifty gold fields in New South Wales, and it is reported that while the gold fields of Victoria are declining in the yield, those of New South Wales are steadily increasing. These samples are to be obtained by some trustworthy person on the spot, from diggers actually at work, so as to leave no question that it is in its entirety the produce of that particular field. With each sample is also to be forwarded a small quantity, say a quart, of the "washing stuff," stating its average yield and thickness. A specimen of each kind of deposit overlying the washing stuff, with a statement of the thickness of each, and of the order in which it occurs, and a specimen of the bed rock. Specimens of auriferous quartz from reefs which are being worked, or which are considered capable of being worked with profit; accompanied in the former case by a statement of the machinery employed, the work performed, and the average yield per ton.

The gold seekers in New South Wales are now working on the quartz veins, and breaking up the quartz, which under the process of stamping, pays, if it only gives two or three ounces to the ton; and looking at the enormous amount of tons of quartz which lie easily exposed to the sun, many years must elapse before it will be exhausted. The Rev. Mr. Clarke predicted, and proved in 1854, that there must be an extensive gold field in the Snowy Mountains, but the geographical situation is such that digging becomes difficult in those ranges. This he considers to be the matrix of all the gold fields south and west. For a considerable portion of the year this range is covered with snow, but in the fine winters that succeed the summers, more gold is sent down from those regions by those who are hardy enough to venture there, than from all the other parts of the colony.

The Committee have also addressed the owners of coal mines, requesting them to furnish samples of not less than half a ton of coal, from each coal seam under their direction, either being worked or capable of being so with profit; informing them that these will be sent to England, first for display, and afterwards for the experimental determination of their commercial value. The whole of these samples to be supplied under the supervision of the Government Examiner of Coal Fields.

Another class of objects intended to be sent are those illustrative of the progress of arts and manufactures, such as soap, candles, and stearine, glue, refined loaf sugar, molasses, sulphuric acid, colonial tweeds, flannel, and other textile fabrics, cabinet work, leather, pottery, works in metals, beer and brandy, pictures and drawings, and objects of natural history.

It is intended to exhibit implements and parts of machinery manufactured of colonial iron and steel; the cabinet woods and workmanship of the colony in an ornamental door, and the state of the art of photography by photographs of the principal buildings. Two or three water-colour drawings by the best artists will be also added to the collection.

In the department of manufactures there will be included specimens of tobacco, wine, silk, jewellery, cutlery,

models, cordials, manufactured skins and leather, pipes, furniture and marble-work, &c. The two departments of raw products and curiosities will include a goodly collection of specimens. I may notice a few of the more interesting articles and exhibits which have already been entrusted to the care of the Commissioners.

The superiority of the colonial timber for purposes of ship-building is shown by a small block of blue gum from the framework of the steamer *William the Fourth*, built by Messrs. Marshall and Lowe, on the Clyde River, in the year 1830. The wood is as hard and as sound as the day it was felled, notwithstanding that it has undergone the wear and tear and exposure of thirty-one years. This small and unpretending item will, no doubt, be viewed with much interest by the shipwrights of the mother country, and also by many old colonists who have travelled at one time or the other in the steamer from which it is taken.

Mr. Scott, of Carrington, near Port Stephens, sends a rare and valuable specimen of the stilted plover, a bird now rarely to be met with. It is in fine condition, and when set up will be an object of interest to all professional and amateur ornithologists.

A native cat-skin rug is contributed by Mr. David Jones, of George-street. This is chiefly noticeable as a specimen of what might be done in the way of a fur trade. The skins are beautifully marked, and have all the glossy softness of the chinchilla.

Mr. Peck, of Sommernil, forwards, with other articles, a block of steatite (soap-stone); while several fine samples of our colonial white and coloured building stone are contributed by Mr. Blackett, the well-known architect. Some blocks of native meerschaum from the recently-discovered quarries in the Clarence River district will also be sent home, together with some smoking pipes manufactured in the colony from the same commodity.

Mr. Ferris, of Sydney, sends some superb specimens of carving in wood. One piece, representing "Cupid bound," is executed in a most elaborate and artistic manner. Four picture-frames, in antique scrollwork, affords further evidence of Mr. Ferris's great skill, taste, and industry in this particular branch of human labour.

A door-bracket, exhibited by Mr. Oram, will serve to show both the beauty of the cedar and the carver's skill in following that heavy Italian scroll-pattern which is so popular at the present time. Numerous articles of furniture from colonial wood will be forwarded by Messrs. Hill and Sons, and also by Mr. Lanehan, of Castlereagh-street.

Among the cereals are some cases of maize in cob, contributed by Mr. Underwood. These will compare favourably with any specimens that may be forthcoming from any other portion of the world, and will prove that, despite any drawbacks, the agricultural capabilities of New South Wales are not wholly overlooked.

A sword, manufactured, the blade by Mr. Jennings, and the hilt by Mr. Julius Hogarth, will also merit special notice. The weapon will combine two great natural products of the towns, and at the same time show that the artists and handicraftsmen are not at all behind their fellow-subjects in England or the workmen of the Continent.

Colonial wines will form not the least important item in the New South Wales department of the Exhibition. Among the list of contributors are the following:—Capt. Russell, Mr. Lindeman, Mr. Blake, Mr. Bettington, Mr. Lawson, and Mr. Sanger (of Albury).

The Commissioners for the Colony intended to receive exhibits up to the 18th September, after which date they proposed holding a Local Exhibition of the selected articles in Sydney. This would extend over a month or six weeks, and the whole was then to be sent on to London in January, under the care of competent persons appointed to arrange for their reception and display in London. Mr. Sedgwick S. Cowper is Secretary to the Local Board, and Edward Hamilton, Commissioner in London for the Colony.

## BRITISH ASSOCIATION, 1861.

The following Paper was read before the Mechanical Section:—

UPON THE MERITS OF THE "BEAM" STEAM ENGINE AS COMPARED WITH THE "DIRECT-ACTION" ARRANGEMENTS, AS A MOTIVE POWER FOR DRIVING MACHINERY USED IN VARIOUS MANUFACTURING PURPOSES. BY W. B. JOHNSON.

The importance of ascertaining, as far as our present progress in mechanical engineering will allow, the best arrangement of stationary engine upon the reciprocating principle, will be apparent to all that have given the subject consideration. But two views are of great weight at the present time; one is the increasing demand that is being made upon motive power for driving machinery made to take the place of manual labour. The unsettled condition and increasing value of labour in this country make it almost imperative that manufactures in every department should be produced with as little dependence as possible upon labour. This is a movement that will eventually call forth a large amount of motive power, and a motive power differing considerably in its arrangement from that now generally adopted. The other view of the subject is of equal importance. If motive power is to be supplied at anything like a moderate cost, as compared with other classes of machinery, it must assume something of a fixed form, and to such a degree as will induce the maker to apply machinery in its manufacture to a much greater extent than has hitherto been done. This would not only lessen the cost considerably, but at the same time improve the quality of the work. It is now generally admitted that machinery produced by the application of tools is in all respects much superior to that produced by hand labour. It may safely be asserted that in no class of machinery is less advantage taken of the assistance of tools than in the production of stationary steam engines. Other reasons might be mentioned for giving the subject of this paper careful consideration. The general consent of engineers to the superiority of steam as a motive power over all other agents, and the universal adoption of the reciprocating piston as the best mode of receiving power from the same, are also ample reasons why an attempt should be made to ascertain the best arrangement for applying such motive power to manufacturing purposes.

Locomotive and marine engineers have, within a comparatively few years, made considerable progress in arriving at the most suitable arrangements of the parts composing such engines; but the stationary engine has remained almost in the same condition in which it came out of the hands of its first originators. Locomotive and marine engineers have abandoned the notion that a "beam" is a necessary part of an engine, but that in some mysterious manner an advantage is obtained by conveying the motive power through a beam, appears still to be the opinion of most engineers engaged in the manufacture of stationary engines.

The stationary beam engine, as ordinarily constructed, is one of the most imperfect pieces of mechanism produced in this country; its parts, taken in detail, are frequently specimens of most excellent workmanship, and exhibit considerable skill in the design, but, when considered as a whole, the machine is dislocated, its parts are numerous, far removed from each other, and in many places it depends upon extraneous support for giving it unity and strength. The foundation work and engine-house walls form the greater part of the framework of the engine, and the engine is thereby subjected to casualties which are quite at variance with one's conception of a perfect machine. Its forces are in various directions, the first mover, the piston, moving apparently without reference to its ultimate purpose, the rotation of the crank-shaft; it starts off, at some distance, at right angles with the shaft. As if afraid at once to face its work, it seems to court a circuitous route in preference to a direct one.

The object of this paper is to bring into comparison with the ordinary beam engine the direct-action engine, and to

show the superiority of the latter over the former, and also to compare the various arrangements of direct-action engines with each other; and, before proceeding further, it may be proper to state, that the term, "direct action" engine, used in this paper, refers to that particular construction in which the power is conveyed from the piston rod to the crank by the intervention of a connecting rod only. The remarks to be made have special reference to condensing engines; preference has been given for some time to direct-action over the beam, for non-condensing engines, the less number of parts in a non-condensing engine making the application of the direct-action principle a simple undertaking.

The principal objections that have been made to the beam engine are:—

- 1st.—The large amount of foundation work required.
- 2nd.—The side walls of the engine-house are required to be built of a strength considerably beyond what is required for a direct-action engine.
- 3rd.—The height required is in most cases objectionable, interfering with the lights in the rooms next to the engine-house.
- 4th.—The number of parts through which the power is conveyed, and consequent liability to derangement.
- 5th.—The serious results of any breakage, the parts in falling, in almost every instance of breakdown, doing considerable if not all the mischief.
- 6th.—The difficulty of observation of and access to the condensing apparatus of the engine.

7th.—The entire dependence of the engine upon the foundation and engine-house walls for unity and support, any settlement in the same causing serious difficulty in readjusting the parts of the engine affected thereby.

These objections are named to enable a comparison to be made with the direct-action arrangements, and to ascertain how far such objections are removed by this principle of construction. Direct-action engines are of two kinds, vertical and horizontal. In the vertical, the reciprocating movement of the piston is in a vertical line with the crank shaft placed either above or below the cylinder. In the horizontal, the movement of the piston is in a horizontal direction; the position of the crank shaft being constant, does not admit of the distinction just named in the vertical.

The vertical arrangement of direct-action engine requires:—

- 1st.—Considerably less foundation work than the beam engine.
- 2nd.—The walls of the engine-house may be built independent of the engine, although in some constructions of this engine the walls are fully as much depended upon as in the beam engine; this is decidedly objectionable.
- 3rd.—The height required is equal to that of the beam engine, and it possesses no advantage over the beam engine in this respect, except that the length of the engine-house is less by about one half.
- 4th.—The number of parts through which the power is conveyed are equal in proportion as 2 is to 5.
- 5th.—The results arising from breakdowns are less severe than in the beam engine, although from its construction it is not free from objection on this ground.
- 6th.—The ease of access to the condensing apparatus will greatly depend upon the arrangement adopted in this part of the engine, but the principle admits of a better one than could be applied to the beam engine.
- 7th.—It is independent of the foundation work and engine walls for unity, "except in instances of imperfect construction;" its forces are self-contained, and it does not therefore suffer from settlement or changes in the building in which it is placed to the like extent as the beam engine.

The vertical direct-action engine has the advantage over the beam engine in the 1st, 2nd, 4th, and 7th points named, and also a slight advantage in the 3rd and 5th points; in reference to the 6th point, "the condensing apparatus," its advantage over the beam engine will en-

tirely depend upon the arrangement adopted for working the air-pump and the relation of its parts.

When the crank shaft is above the cylinder, these parts may be conveniently arranged so as to be easy of access and observation, and at the same time be within a suitable distance from the cylinder; but when the crank shaft is below the cylinder, the condenser is far removed from the cylinder, which is an objection to this description of vertical direct-action engine. From this it appears that the best arrangement of vertical direct-action engine is the one having the crank shaft above the cylinder. A very excellent engine can be made by having the cylinder, condenser, air-pump, and framework well secured to one strong foundation plate; such an engine would be compact, yet easy of access to all its parts, and would possess that unity which is absolutely necessary for perfection in every class of machinery. Were it not that the particular position of the crank shaft is inapplicable in most cases where power is required, this construction of engine would merit the careful consideration of engineers to bring it up to a standard point of perfection.

The horizontal arrangement of direct-action engine, when compared with the beam engines, requires:—

1st.—Less foundation work, although this varies according to the different modes of working the air-pump.

2nd.—The engine is wholly independent of the engine-house walls, consequently they may be reduced to a minimum in strength.

3rd.—The height required is much less, being from one-third to one-half of that necessary for a beam engine.

4th.—The number of parts through which the power is conveyed are reduced in proportion as two is to five.

5th.—The results of break-downs are much less destructive, the whole of the working parts being within a limited distance from the floor, and therefore cannot cause any injury in falling.

6th.—The condensing apparatus, and all other parts of the engine, are easy of observation and access, except in some arrangements about to be referred to.

7th.—It is independent of the foundation work and engine-house walls for unity; its forces are self-contained, and it does not therefore suffer from settlement or changes in the building in which it is placed, to the same extent as the beam engine.

The horizontal direct-action engine has the decided advantage of the beam engine in the 1st, 2nd, 3rd, 4th, 5th, 6th and 7th points of comparison, and also has some advantages over the direct-action on the vertical arrangement. For general purposes the crank shaft is conveniently situated; the lines of movement and position of the working parts are also conveniently placed for observation and access; these considerations point to this arrangement of engine as the most suitable for general adoption, and it merits from engineers and those requiring motive power that consideration and attention necessary to place it in its proper position as the best arrangement of stationary steam engine.

Various modes have been adopted for working the air-pump in horizontal direct-action engines—the relative positions of the condensing apparatus is a question of the utmost importance in endeavouring to make this engine efficient in working, compact and united in its parts, and at the same time easy of access for examination. One arrangement for accomplishing this consists in working the air-pump from the crank-pin, by a supplementary crank and shaft, and in some cases levers actuated by the crank-pin are employed for this purpose; but either of these, or any other mode of working the air-pump from the crank-pin, are objectionable; the parts of the engine are necessarily separated from each other—there is a want of unity and compactness; the strains are in various directions; the foundation work is considerably extended; and the air-pump and condenser are so far below the engine-house floor as to be inconvenient for examination.

Another mode of working the air-pump is by levers attached by links to the piston-rod, cross-bar or mounting,

in some arrangements of which the fulcrum of the levers is fixed above the horizontal centre line of the engine, and in some below. This may in some respects be superior to the mode first named, but still objection can reasonably be made to the number of parts required, and consequent liability to derangement. The strains are in a variety of directions; it is not united and compact; it requires extra foundation, and is frequently difficult of access for examination.

Perhaps the most correct notion of working the air-pump is that of attaching the air-pump rod direct to the piston-rod, without the intervention of levers, links, or any moveable joints. One mode of effecting this is by placing the air pump a slight distance from the end of the cylinder farthest from the crank shaft, and attaching the air-pump rod to the piston-rod which works through the back cylinder cover. This arrangement adds considerably to the length of the engine, and to avoid this the connecting rod is frequently made much shorter than is desirable for easy working. Another mode of carrying this arrangement out is effected by placing the air-pump near to the end of the cylinder next to the crank, the piston rod being continued through the air-pump on to the piston-rod mounting; the air-pump is between the piston-rod mounting and the cylinder end. The same objection applies to this mode, in regard to length, as to the former one, and attempts are made to overcome the difficulty in the same objectionable manner, "shortening the connecting rod," and by cramping up the parts, so as to make them difficult of access. Another and third mode of working the air-pump direct from the piston-rod consists in placing the air-pump between the piston-rod mounting and crank, the space between the air-pump and cylinder being sufficient to allow for the working of the piston-rod mounting and guide blocks. The extra length of the engine is not so much as in the former arrangements, and what extra length is required is added to the length of the connecting rod.

The three constructions of engines just mentioned have in common considerable advantages over any other of the direct-action arrangements named in this paper. The foundation is a level bed, less in extent, without any breaks or depressions, and can therefore be more firmly bound together; the number of working parts are brought down to a minimum, not exceeding in joints and wearing surfaces beyond what is required for a non-condensing engine; the liability to derangement is consequently reduced in equal proportion. Every part of the engine is within the limits of easy examination, no part being under the engine-house floor, nor so far above it as to require any stage work, or second height of flooring. The strains are self-contained, and are all in one direction, and admit of a maximum unity and strength to be obtained with a minimum amount of material.

Other advantages peculiar to this arrangement—"working the air-pump direct"—might be mentioned, but sufficient has been said to show that it possesses claims which entitle it to the attention of all interested in the production and use of stationary steam-engines.

Engines have been made upon the various plans referred to, and they have shown in their comparative efficient working most clearly the truth of that almost universally admitted opinion in mechanical engineering—"that the success of a machine is in proportion to its simplicity"—of course, supposing correct principles to be adopted in the construction. Engines have been made upon the arrangement last mentioned, in which convenience of access is carried to an extent far beyond what would have been considered possible a few years ago; air-pump foot and delivering valves can be taken out and replaced; air-pump bucket packed, and cylinder-piston examined within one hour, and without the employment of extra labour beyond what is usual for such purposes. Facilities for examination is next in importance to the good working of an engine, and cannot be too carefully provided for—and in reference to special and economical working, this arrangement compares most favourably with all other constructions of engines hitherto adopted.

Great freedom has been taken with the beam engine in pointing out some of its defects—or which may fairly be considered objections to it—and it will now only be doing justice to subject the direct-action principle to the same ordeal. To the vertical direct-action arrangement no objections can be named beyond those already mentioned, but to the horizontal arrangement an objection was raised against it at its first introduction, and is still maintained by engineers of undoubted celebrity. The horizontal position of the cylinder is objected to on account of the piston in its movement wearing the lower more than the upper side of the cylinder; now, this is a question that can be best decided by a careful reference to the numerous examples of this kind of engine now at work; facts bearing upon this question can be obtained in almost any quantity, and it is desirable the task should be undertaken to ascertain how far this objection can be sustained. The horizontal principle in all probability will be extensively adopted for engines of a maximum size, and it would be well to ascertain, before proceeding too far in this direction, the true value of this objection. It has been found that, in all instances in which proper care has been taken, this objection is groundless, and cylinders upon the horizontal arrangement are wearing as equally as those placed vertically. It may be proper to remark that in horizontal engines too much care cannot be bestowed in endeavouring to make the piston and mounting and guide blocks as perfect as possible. The surfaces should be large, to prevent rapid wearing down, and the construction should be such as will admit of the piston-rod mounting being easily adjusted to its correct centre with the cylinder. With such arrangements, and the parts correctly made and put together, the evils implied in the objection just named are found in practice fully provided against.

No reference has been made to the various kinds of valve arrangements applied to the cylinders of engines, whether beam or direct-acting. The direct-action does not in this respect compare unfavourably with the beam engine; the horizontal arrangement perhaps has the advantage of any other in admitting valves of any construction to be applied in a simple and an efficient manner.

Reference has not been made to the other detail parts, the object of this paper being principally to deal with the broad question—Beam *versus* Direct-action, and on this point the distinctive features in all the arrangements considered, and those by which the type of the engine is chiefly affected, is, the position and mode of working the air-pump, and, therefore, almost exclusive attention has been given to them.

Before concluding it may be proper to draw attention to the manner in which most horizontal engines have hitherto been made. The ignorance displayed in many designs, and the imperfect character of the material and workmanship employed, have done much to bring the principle into disrepute; engines of bad construction have been put to a duty far above their capabilities. As a matter of course, they have given no satisfaction, but much trouble, and the principle at last bears the whole of the blame, when, in fact, it has nothing whatever to do with it. The horizontal engine is simple, but that is no reason why it should not be good in design, and of proper materials and workmanship; let the horizontal engine have skilful and careful attention in the design, be well executed, and put to its proper amount of duty, and it will not be long before it attains that position, as the best of engines, which by its beautiful simplicity it is so justly entitled.

## EXAMINATION PAPERS, 1861.

(Continued from page 748.)

The following are the Examination Papers set in the various subjects at the Society's Final Examinations, held in April and May last:—

## LATIN AND ROMAN HISTORY.

THREE HOURS ALLOWED.

### SECTION I.

Translate—

Stabat acuta silex, præcisus undique saxis  
Speluncae dorso insurgens, altissima visu,  
Dirarum nidis domus opportuna volucrum.  
Hanc, ut prona iugo lævum incumbibat ad amnem,  
Dexter in adversum nitens concussit, et imis  
Avulsam solvit radicibus; inde repente  
Impulsi; impulsu quo maximus intonat aether,  
Dissultant ripae reffuitque exterritus amnis,  
At specus et Caci detecta apparuit ingens  
Regia, et umbrosæ penitus patuere cavernae.—Æn. viii.

1. Parse (giving both accidence and syntax,) saxis, dorso, insurgens, domus, nidis, iugo, radicibus, quo.
2. Conjugate the verbs to which belong stabat, præcisus, incumbibat, nitens, concussit, avulsam, impulsu, intonat, detecta, patuere.
3. Decline silex, domus, impulsu, aether, specus, ingens, cavernae.

### SECTION II.

Translate—

Fecerat et viridi fetam Mavortis in antro  
Procubuisse lupam: geminos huic ubera circum  
Ludere pendentes pueros, et lambere matrem  
Impavidos; illam tereti cervice reflexam  
Mulcere alternos, et corpora fingere lingua  
Nec procul hinc Romam et raptas sine more Sabinas  
Consessu caveae, magnis Circensibus actis,  
Addiderat, subitoque novum consurgere bellum  
Romulidis Tatitque seni Curibusque severis.  
Post idem, inter se posito certamine, reges  
Armati Jovis ante aram paterasque tenentes  
Stabant et caesa jungebant foedera porca.—Æn. viii.

1. Explain the historical allusions in this passage.
2. Parse (giving both accidence and syntax,) procubuisse, huic, cervice, linguâ, Circensibus, Romulidis, certamine, foedera.
3. Conjugate the verbs to which belong lambere, reflexam, mulcere, fingere, raptas, addiderat, posito, tenentes.
4. Decline, ubera, tereti, more, consessu, seni, reges, Jovis.

### SECTION III.

Translate—

Moverat plebem oratio consulis; erecti patres restitutam credebant rem publicam. Consul alter, comes animosior quam auctor, suscepisse collegam priorem actiones tam graves facile passus, in peragendis consularis officii partem ad se vindicabat. Tum tribuni eludentes velut vana dicta persequi quaerendo, quonam modo exercitum educturi consules essent, quos dilectum habere nemo passurus sit? "nobis vero" inquit Quinctius, "nihil dilectum opus est, cum, quo tempore P. Valerius ad recipiendum Capitolium arma plebi dedit, omnes in verba juraverint conventuros se jussu consulis nec injussu abituros. Edicimus itaque, omnes, qui in verba jurastis, crastina die armati ad lacum Regillum adsitis." Cavillari tum tribuni et populum exsolvere religione velle: privatum eo tempore Quinctium fuisse, quum sacramento adacti sint.—Livi, iii., ch. 20.

1. Parse (giving accidence and syntax,) plebem, suscepisse, persequi, quos, dilectum, nobis, conventuros, armati, adsitis.
2. Conjugate the verbs to which belong moverat, credebant, passus, quaerendo, recipiendum, abituros, edicimus, exsolvere, adacti.
3. Decline rempublicam, comes, rei, partem, exercitum, religione.
4. Mention the verbs in this passage that are in the subjunctive mood, and give in each case the reason why.

## SECTION IV.

Translate—

Haec vociferante Horatio quum decemviri nec irae nec ignoscendi modum reperirent, nec quo evasura res esset cernerent, C. Claudii, qui patruus Appi decemviri erat, oratio fuit precibus quam jurgio similis, orantis per sui fratris parentisque ejus manes, ut civilis potius societatis, in qua natus esset, quam foederis nefarie icti cum collegis meminisset. Multo id magis se illius causa orare quam rei publicae: quippe rem publicam, si a volentibus nequeat, ab invitis jus expetituram. Sed ex magno certamine magnas excitari ferme iras; earum eventum se horrere. Cum aliud praeterquam de quo retulissent, decemviri dicere prohiberent, Claudium interpellandi verecundia fuit. Sententiam igitur peregit nullum placere senatus consultum fieri, omnesque ita accipiebant, privatos eos a Claudio judicatos, multique ex consularibus verbo ad sensi sunt. Alia sententia, asperior in speciem, vim minorem aliquanto habuit, quae patricios coire ad prodendum interregem jubebat. Censendo enim, quoscumque magistratus esse qui senatum haberent, judicabant, quos privatos fecerat auctor nullius senatus consulti faciendi.—Livi, iii., ch. 40.

1. Parse (giving accident and syntax,) irae, precibus, sui, societatis, expetituram, Claudium, verbo, magistratus, quos.

2. Conjugate the verbs to which belong ignoscendi, cernerent, meminisset, nequeat, retulissent, peregit, ad sensi, coire, fecerat.

3. Decline oratio, precibus, foederis, eventum, speciem, vim, senatum.

## SECTION V.

1. Give an account of the constitution of Servius Tullius.

2. What was the purpose of the Decemvirate?

3. Narrate the causes and the consequences of passing the Licinian laws.

4. Mention the steps by which the assembly of the Comitia Curiata was deprived of its powers.

5. What degree of citizenship could be conferred, according to Roman law, on foreigners.

## SECTION VI.

1. Give an account of the great Latin War and its results.

2. Sketch the history and character of Hannibal.

3. Give a brief account of Coriolanus, Publilius Philo, Fabius Maximus, Appius Claudius the Blind, Cn. Flavius, Metellus.

4. What was the first war waged by Rome out of Europe? What caused it and what followed it?

5. What Roman writers lived before or during the time of Augustus, and what were their chief works?

## FRENCH.

THREE HOURS ALLOWED.

## PART I.

Candidates for a third-class Certificate are required to translate into English the following French fable, and to answer the grammatical questions thereto annexed (in the order in which they are placed). This first Part is all that will be expected of them.

Translate into English:—

LA VIPERE ET LA SANGSUE.

La Vipère disait un jour à la Sangsue :

Que notre sort est différent !

On vous cherche, on me fuit ; si l'on peut, on me tue ;

Et vous, aussitôt qu'on vous prend,

Loin de craindre votre blessure,

L'homme vous donne de son sang

Une ample et bonne nourriture :

Cependant vous et moi faisons même piqûre.

La citoyenne de l'étang

Répond : Oh ! que nenni, ma chère ;

La vôtre fait du mal, la mienne est salutaire,  
Par moi plus d'un malade obtient sa guérison ;  
Par vous tout homme sain trouve une mort cruelle.  
Entre nous deux, je crois, la différence est belle :

Je suis remède, et vous poison.

Cette fable aisément s'explique :

C'est la satire et la critique.—FLORIAN.

1. Add to each of the following nouns a suitable adjective, which will show its gender :—*Atmosphère, écriture, incendie, parapluie, passage, précipice, intervalle, espace, armistice, sentinelle.*

2. Write the plural of the words, *Bijou, clou, travail, attirail, œil, ciel*—*égal, impartial, fatal*—*votre, le mien, le vôtre.*

3. Write the feminine of the adjectives, *blanc, Grec, Turc, frais, favori, sec, fou, malin, vengeur, vieux, bénin, faux.*

4. When are the adjectives *beau, mou, vieux*, changed into *bel, mol, vieil*, and what is the object of the change? Name other adjectives that are affected by the same rule.

5. What is the rule as to the agreement of an adjective that relates to several substantives of different genders, in sentences like this—His father and mother are aged?

6. Explain the peculiar rule concerning the agreement of adjectives that qualify the substantive *gens*, taking as an example this sentence :—Old people are sometimes suspicious.

7. The following substantives have two genders :—*Aigle, enseigne, hymne, manche, mémoire, mode, mousse, pendule, poste, tour, vase, voile.* State distinctly what each of them means when masculine and what it means when feminine. Place them in distinct columns, thus :—

MASC.

FEM.

Un aigle—(the English.)

Une aigle—(the English.)

8. Write fully—80 candidats, chapitre 80, 300 volumes, l'an 1800.

9. When is one thousand expressed by *mil*, instead of *mille*?

10. How is *en* introduced in sentences like these :—Give me a dozen ; I shall not buy any more?

11. What peculiarities of orthography are there in the conjugation of the verbs, *Manger, placer, essuyer, espérer, rappeler, jeter, acheter*?

12. Translate into French :—It ought to be written. We ought to write it. It must be written. It could be written. It may be written. It can be written. It might be written. We may write it. We must write it. They must write it. We should write it. We could write it.

13. Give the infinitive mood, with the English, of the following verbs :—*Frapper, mais écoute. Dormez-vous? Viens. Qu'il accoure. Je suis venu, j'ai vu, j'ai vaincu. Fais ce que dois, advienne que pourra.*

14. Conjugate the verb *S'en aller*, giving the first person singular and plural of all tenses, including the compound ones, with the English.

## PART II.

Candidates for a Second-class Certificate are expected to answer the next four grammatical questions, and to translate the extract and idiomatic expressions which follow :—

1. Write the word *quelque* in the following sentences :—

(a) Un railleur s'attire toujours — mauvaises affaires.

(b) — bons traducteurs qu'ils soient, ils ne comprendront pas ce passage.

(c) — soient les hommes, il faut vivre avec eux.

(d) L'ennemi a tiré — mille coups de canon.

2. Write the word *tout* in the following sentences, —

(a) Ces fleurs sont — aussi fraîches aujourd'hui qu'hier.

(b) Cette étoffe est — soie.

(c) La pauvre femme est — étonnée, — stupéfaite de cette étrange nouvelle.

3. Give each participle past its proper spelling in these sentences :—

(a) Je vous ai *renvoyé* les livres que vous m'aviez *prêté*.  
(b) Les avocats que j'ai *entendu* plaider ont compromis leurs causes.

(c) Les romances que j'ai *entendu* chanter sont charmantes.

(d) Les chaleurs qu'il a *fait* les ont *rendu* malades.

4. Give each verb in brackets in the following sentences, its proper mood and tense :—

(a) Je désire que vous [réussir] dans cet examen.

(b) Je ne pense pas que cela [pouvoir] vous embarrasser.

(c) J'ai peine à croire qu'il [avoir] déjà fini.

(d) Montrez-moi quelqu'un qui [être] plus consciencieux.

Translate into French :—

Would you know whether the tendency of a book is good or evil, examine in what state of mind you lay it down. Has it induced you to suspect that what you have been accustomed to think unlawful, may after all be innocent, and that that may be harmless which you have hitherto been taught to think dangerous? Has it tended to make you dissatisfied and impatient under the control of others; and disposed you to relax in that self-government without which both the laws of God and man tell us there can be no virtue, and consequently no happiness? Has it attempted to abate your admiration of what is great and good, and to diminish in you the love of your country and your fellow-creatures? Has it addressed itself to your pride, your vanity, your selfishness, or any other of your evil propensities? Has it defiled the imagination with what is loathsome, or shocked the heart with what is monstrous? Has it disturbed the sense of right and wrong the Creator has implanted in the human soul? If so—if you are conscious of all or any of these effects—or if, having escaped from all, you have felt that such were the effects it was intended to produce, throw the book into the fire, whatever name it may bear on the title-page. Throw it into the fire, young man. Young lady! away with the whole set, though it should be the prominent feature in a rosewood bookcase.—SOUTHEY.

Translate :—

Venir parler.	Donner dans le piège.
Venir pour parler.	Donner sur l'ennemi.
Venir de parler.	Donner sur le parc.
Venir à parler.	Donner sur les doigts.
En venir à parler.	En donner à garder.

Il en tient.	Je suis des vôtres.
J'y tiens.	Je n'y suis pas encore.
Je m'en tiens là.	J'en suis pour mes peines.
Tenez, tenez-vous à cela.	J'en suis encore à l'apprendre.

And also :—

- (1.) What are you driving at?
- (2.) He is not so easily imposed upon.
- (3.) They left him in the lurch.
- (4.) He is at his wits' end.
- (5.) He does not know which way to turn.
- (6.) If I were you, I would have nothing to do with it

### PART III.

Candidates aiming at a First-class Certificate are expected to do justice to *any four* of the five following subjects :—

1. GRAMMAR.—Answer the four grammatical questions in Part II.

2. IDIOMS.—Translate the above list of idiomatic expressions (in Part II).

3. WEIGHTS AND MEASURES.—Explain in French the origin and meaning of the words *mètre*, *litre*, and *gramme*, and compare the *kilogramme*, the *hectolitre*, and the *kilomètre*, with the corresponding English weights and measures.

4. LITERATURE.—Sketch briefly the life and name the principal works of any three of the following writers of the 17th century :—

Descartes.	Boileau.
La Rochefoucauld.	La Fontaine.
Pascal.	Fénélon.
Mme. de Sévigné.	Massillon.

5. HISTORY.—Write a short account of the "Ligue" in connection with the reign of Henri IV.; or, if you prefer it, write a short essay on the administration of Sully.

(To be continued.)

### NEW PAINT FROM ANTIMONY.

About six months ago a patent was taken out by Messrs. Hallett and Stenhouse for the manufacture of a paint from native oxide of antimony—a mineral which is found in considerable quantities in Spain, Borneo, and other localities, where it is usually associated with the grey sulphide of antimony, from which it has been produced by the process of oxidation, which, as might be expected, is found to be more or less complete. This native oxide of antimony, whose colour varies from light-yellow to yellowish-red, occurs usually massive, and consists of antimony combined with oxygen in different proportions, and generally contains some sulphide of antimony, silica, &c.

The oxide is first reduced to coarse powder, and is then roasted for three or four hours, at a low red heat, with free access of air, in mufles or other suitable furnaces. During the process of roasting the sulphur and other volatile matters are expelled, the colour of the substance becomes much paler, and the residuary metal is converted, for the most part, into antimonious acid. The calcined product is then reduced to an impalpable powder by being ground in flint mills, and, when dried and mixed with oil, constitutes the paint.

The paint has a delicate stone colour, and is quite equal in body or capacity to the best white lead; while it possesses the great advantage of maintaining its colour in vitiated atmospheres—being not acted upon either by acids or sulphuretted hydrogen. This property renders it peculiarly adapted to interiors of ships, gas works, and hospitals. It is devoid of anything hurtful to workmen, either in its manufacture or use; and as (weight for weight) it will go fully 25 per cent. further, as a pigment, than the best white lead, and its price being considerably lower, the new antimony paint promises, ere long, to be very generally employed.

### DISCOVERY OF GOLD IN THE VALLEY OF THE SASKATCHEWAN.

Mr. A. K. Isbister, author of a paper on the Hudson's Bay Territories, read before the Society last session, says :—

"I have just received a letter from the Red River colony, in the Hudson's Bay territory, announcing the discovery of a valuable gold field by a party of American miners from California, on the north branch of the Saskatchewan. This intelligence I see confirmed in recent papers published at St. Paul's, Minnesota, and it may therefore be relied on as accurate. Two gentlemen from California have recently arrived in that town with a considerable quantity of gold collected by themselves along the upper waters of the Saskatchewan, and they describe the yield and quality of the metal as promising to be quite equal to that of British Columbia, which I need hardly say occupies the opposite flank of the Rocky Mountains, and may therefore reasonably be inferred to be of a similar geological character, while we know that it is watered by streams which have a common origin in the same auriferous range with the northern tributaries of the Saskatchewan."

EXTRACTS FROM THE REPORTS OF H.B.M.  
CONSULS.

(Continued from page 648.)

**SANTO DOMINGO.**—Santo Domingo is rich in copper and in other ores. There are districts abounding in rich copper ore which would yield a handsome profit to mining speculations. The legislature has endeavoured to facilitate such enterprises by granting privileges to such undertakings; but though in some instances the copper ore is met with on the surface, and requires merely to be transported to the seacoast, no capital has yet been found to commence the enterprise. Santo Domingo is still so little known that the want of proper information of its climate, resources, and institutions is the greatest obstacle to induce foreigners to employ their capital for the development of its riches.

**EXPORTS OF THE ISLAND OF TAHITI.**—The island of Tahiti itself produces for exportation oranges and firewood. Cocoa-nut oil, pearl shells, and oranges form the principal articles of island produce exported. The two former commodities are for the most part sent to Valparaiso and Sydney, and occasionally shipments are made direct for England. Oranges are almost wholly exported to San Francisco, California, though, from time to time, cargoes are forwarded to Australia.

**THE WHALE FISHERY OF MAGDALENA BAY.**—"I also feel it my duty to report the following particulars relative to Magdalena Bay, on the coast of Lower California, obtained when there during the present month, as its navigable extent and importance as a whaling station, was, to us, new, and may prove interesting information. The captain of the whaling barque *Carrib* of San Francisco, states that from twenty-five to thirty American vessels fish those waters annually, for the cow whale of the black-fish species who resort to them for calving; they agree not to commence the run until 1st December; that the northern channel extends to Bellenas Reef, which makes the third outlet to the sea, north of Cape St. Lazarus; that in one opening there is a passage with a depth of five fathoms, though the rollers are heavy; that he has taken his ship seventy miles up this northern estuary by lightening her draft to twelve feet; that during the whaling time, the natives traffic with them at stations both in the south-western part of Amegas Bay and to the northward, exchanging cattle and venison for clothing, &c. Our only previous knowledge being from Sir Edward Belcher's survey, the remarks in Findlay's Pacific Directory, and a previous visit by Mr. Hill, the master of this ship, when with Captain Kellett in Her Majesty's Ship *Herald*, in 1843, neither having any idea of the navigable extent of it, determined me on seeing, so far as time permitted, the nature of this water, taking Mr. Hill, who is a thorough practical surveyor, we succeeded in getting so far as the second opening to the sea, finding the depth of water quite equal to the American captain's description, and, in many places, over five fathoms. The sameness of the Mangrove Islands with which this immense sheet of water abounds, makes the course of the channel somewhat difficult to keep in a boat, though the deep water lines would be clearly seen from the height of a few feet. We found fish of various kinds, turtles and shell fish; as also hares and wild fowl in abundance, but no sign of fresh water. The whalers obtain a supply of inferior and somewhat brackish water by sinking casks in the sand, and firewood in any quantity."

## Home Correspondence.

FOREIGN WORKMEN AND THE GREAT  
EXHIBITION OF 1862.

SIR,—Being in Antwerp on a late occasion, to attend the European Art-Congress, I profited by the opportunity

to extend my travels to the principal cities of art and industry in Holland, Prussia, Saxony, Hanover, the Rhine Provinces, and Belgium, in all of which I find the forthcoming Exhibition regarded with great interest, and the preparations both active and important (though at Amsterdam I perceived the erection of a Crystal Palace of extensive proportions, for an exhibition of their own). With these I have at present little to do, but will indicate the feeling of the foremen and workpeople as to their visiting London in 1862. Having questioned a great many of the higher classes of operatives, as also the artists and art-workmen, I find the thing most dreaded by them is the expense, not so much of locomotion to and from England, for they have full faith in trains of pleasure at low fares, as the price of doubtful lodgement in London, and living also, though of the two I think they fear the lodging-house or hotel most,—a dread founded upon the slight experience of their *confrères* in 1851. I have often been asked if the promoters of the Exhibition intended to provide for or protect the humble order of visitors next year, many of whom, though artisans of the first-class, are not able to make known their wants in either French or English.

Now, I think, Sir, that it is quite time that something should be done, either on the part of the Society of Arts or the Royal Commission, to meet this want—to give assurance to the humble *voyageur* of the aid he may expect. Certainly much could be done to provide temporary homes or camping-ground, at a small cost to the individual, but sufficiently remunerative in the mass—in fact, to do in a perfect manner what was improvised in the case of the Orpheonists' visit. I speak of the accommodation afforded to this body, unpopular as the arrangements were, as perhaps it is the only attempt made to locate a large body of visitors at a small charge and a short notice. I will not enter upon a debateable question, now at rest, but try to draw some experience therefrom. The Orpheonists have come and gone, had a warm reception in the wettest summer known, and had their payment for lodging returned by the corporation of London. What landlords could be more liberal?

Now, in 1862, I do not see why these great hotels at Islington should not again be brought into requisition (as indeed any other large buildings easily convertible), to lodge large numbers at moderate cost. They are splendid edifices, most conveniently situated by the North London Railway, affording easy communication both east and west of London, that can be seen at one view from their windows, an object of no slight importance to the stranger who may have to learn localities in but little time. When I last saw these hotels, the beds of the Orpheonists covered the floors of the great rooms in every direction, affording sleeping or rather resting places, of a hard and primitive sort, without chairs, place for baggage, or any screen whatever; the improvised lavatories being upon the ground-floor and free to all. With a very little arrangement, these and other places could be converted into lodgements for the mass of visitors, by dividing spaces to contain a small iron bedstead, two chairs, a table, lavatory, gas light, looking-glass, and three hat-pegs. No fire would be required or desired in the summer season.

For a convenient camping ground, I do not think a better spot could be chosen than that by the Corporation of London, at Islington, at least for one station, at a stated tariff, to be made known at all the railways in three or four languages.

In fine, it is much to be hoped that this or other schemes will be matured to tempt the humble *voyageur*, of limited means, to visit our shores, and to protect him whilst here. If we can, in 1862, but disabuse the foreigner of the idea that London is the dearest capital in the world, we shall have done much.

I am, &amp;c.,

JOHN LEIGHTON.

Regent's-park, Sept. 24, 1861.

## INTERNATIONAL EXHIBITION OF 1862.

SIR,—Will you allow me to submit for consideration, in respect to the International Exhibition of 1862, as well as for exhibitions in general, the following example of what I deem an important improvement in arranging the articles for exhibition, namely, placing together objects of competition for prizes, from whatsoever source derived. I can speak from experience, as a juror, of the great convenience and advantage of such a mode of classification for decision, as well as to the public for interest and instruction in inspection.

In the Transactions of the Highland Society, speaking of the Perth Show, it is observed :—

"We think we state the truth in saying that ninety-nine out of every hundred visitors, whether from our own or from foreign parts, greatly prefer the system adopted by the Society, of having harrows placed beside harrows, and ploughs beside ploughs, &c. It is quite distracting and unsatisfactory to hunt through general collections for the examination and comparison of implements. A great waste of time is the result. It is all very well for those who can afford to spend some days in the show-yard, to go with catalogue in hand and make the most minute inspection. But it must be kept in mind that the vast majority of visitors have only a limited time to make the round of the show-yard. The most complete and indexed catalogue would not assist them much. All wish to see what improvements are taking place in the manufacture of the various implements of the farm, and in no way can this be done so thoroughly and quietly as when they are arranged by the Society.

"No doubt it entails great inconvenience to the implement makers having their implements distributed over the yard, classified in the different sections. Their complaints may be well enough founded. There is no compulsion, however, on the part of the Society to make them enter their articles for competition. Exhibitors, therefore, may, if they choose, show implements only in their stands, and decline to undergo the disadvantages of the present system. So long, however, as the Society holds to its functions of awarding prizes for certain classes of implements, we do not see how they could be attending to the interest of the public but to follow the present system of classification. As Mr. Patterson suggests, exhibitors must first show duplicates of the implements they enter for competition, and let all their implements have the numbers of their stands affixed to them."

I am, &c.,

ONE OF THE INTERNATIONAL JURY  
FOR THE UNIVERSAL EXHIBITION  
AT PARIS.

## INTERNATIONAL PHILANTHROPIC CONGRESS OF 1862.

MR. EDITOR,—Having been one of the Vice-Presidents at the Meeting of the Congrès International de Bienfaisance, held in Frankfort-on-the-Maine, in 1857, and having presented a Report on that meeting to the Statistical Society of London, as well as having given to the National Association for the Promotion of Social Science an account of the origin of this International Association, and of the proceedings at its two past meetings, both of which papers are given in the Transactions of the respective Societies,\* I feel it incumbent on me to point out an

error in the very interesting announcement made in the last number of your *Journal* (Sept. 27), with reference to the contemplated Meeting of the Congress in London next year.

Both Mons. Ed. Ducpetiaux and Mr. Twining refer to it as the "fourth" meeting of the Congress, whereas it will be, in reality, only the "third" meeting, as may be seen by a reference to the published "Compte Rendu" of the two previous meetings; the first of which was held in Brussels, in 1856, and the second in Frankfort, in 1857. I have before me, also, a brief notice, or Report, published at Brussels, in 1857, which I received from M. Ducpetiaux, thus entitled :—"Congrès International de Bienfaisance—Deuxième Session à Francfort-sur-le-Main," in which, at page 2, the following announcement is made :—"La troisième Session du Congrès International de Bienfaisance aura lieu, selon toute probabilité à Londres en 1859, en coincidence avec le Congrès de Statistique, qui a tenu cette année sa troisième Session à Vienne."

Circumstances, in some respects similar to those which led to the postponement of the meeting of the International Statistical Congress in London until last year, rendered it desirable that the meeting of the International Philanthropic Congress should be also postponed. But the approaching Great Exhibition of 1862, when a large number of distinguished foreigners will be attracted to our metropolis, has long been considered the fitting occasion for a meeting of the Congress in London, and at the Council of the National Association for the Promotion of Social Science it has been repeatedly referred to as affording the opportunity for that interchange of experience with practical philanthropists of other countries, which is the main object of the international Association, and one so well calculated to promote, as well as to call into active operation, the feeling of common brotherhood and Christian charity. It is therefore matter for congratulation that our Continental neighbours have their minds already directed to this important object in connection with the Exhibition of 1862.

I am, &c., HENRY ROBERTS.

Athenæum Club, October 1, 1861.

## PATENT LAW AMENDMENT ACT.

APPLICATIONS FOR PATENTS AND PROTECTION ALLOWED.

[From Gazette, September 27th, 1861.]

Dated 3rd July, 1861.

1692. R. Jolley, 47, St. John-street, Smithfield—An improved apparatus for heating, cooling, or drying, infusing, extracting, or absorbing vapours and gases for manufacturing, medical, or domestic purposes, and for preserving liquids and solids alimentary or otherwise.

Dated 20th July, 1861.

1834. M. Henry, 84, Fleet-street—Imp. in the method of, and apparatus for, obtaining an increased effect from lights. (A com.)

Dated 29th July, 1861.

1889. W. Busby and D. Busby, Liverpool—Imp. in street or road rails for omnibuses and other vehicles.

1848, 1851, 1852, and 1853, were the occasion of bringing together individuals from the different countries actively engaged in the amelioration of the condition of the labouring and necessitous classes. And at the Congrès Statistique, held in Brussels in 1853, the desire was unanimously expressed of uniting in a general Congress those who, in different countries, are occupied with questions relating to the physical, the moral, and the intellectual improvement of the working classes, and the relief of the indigent. This idea was revived at the "Conference International de Charité," organised in Paris by the "Société d'Economie Charitable," on the occasion of the Great Exhibition held there in 1855, and it was followed by the convening of the Congrès International de Bienfaisance, the first meeting of which took place in Brussels in 1856.

\* Vide "Journal of the Statistical Society of London," for September 1858. "Transactions of the National Association for the Promotion of Social Science," for 1851, fol. 632. In reference to these Reports I would correct an error in my having named Frankfort as the place of meeting of the Congrès Penitenciaire, in 1847, instead of Brussels, where the idea of an Association International de Bienfaisance appears to have originated. The progressive stages of its development were as follows :—The "Congrès Agricoles, d'Hygiène Publique, et de Statistique," which assembled in Brussels in

*Dated 1st August, 1861.*

1913. A. Powell, Liverpool—Imp. in the manufacture of boots, shoes, and other coverings for the feet. (A com.)

*Dated 2nd August, 1861.*

1921. J. E. Drouot, 4, South-street, Finsbury—Imp. in machinery or apparatus for kneading.

*Dated 3rd August, 1861.*

1932. P. O'Hanlon, Nile street, Kingston-upon-Hull—Imp. in marine and other steam boilers with reference to economy of fuel.

1936. J. Lewis, Rathmines, Dublin—Imp. in producing and treating printing surfaces, in producing and preparing transferring surfaces, in transferring, in producing impressions on an altered scale, in preparing or treating surfaces of lithographic stones, and in obtaining devices or designs; also in agents and apparatus used in some of such imps. parts of the invention being also applicable to photography, and to ornamenting pottery, porcelain, and glass.

*Dated 6th August, 1861.*

1956. W. Clark, 53, Chancery-lane—Imp. in bleaching and clarifying saccharine matters and in apparatus for the same. (A com.)

*Dated 9th August, 1861.*

1991. A. F. B. Falgas, 51, Rue de Malte, Paris—Imp. in the construction of trusses and bandages for hernia, and of hypogastric girdles or belts.

*Dated 12th August, 1861.*

2003. W. Edwards and E. Edwards, Coventry—Imp. in apparatus connected with railway breaks.

*Dated 13th August, 1861.*

2008. J. C. Horner, Avenue-road, Hammersmith—Certain imp. in looms for weaving. (A com.)

*Dated 16th August, 1861.*

2030. J. C. Rivett, J. Vickers, and S. Hayes, Farnworth, near Manchester—Imp. in machinery and apparatus for spinning and doubling fibrous materials.

*Dated 20th August, 1861.*

2079. J. Ellis, 62, Minorities—Imp. in means for sizing corks or separating the larger from the smaller sized corks.

*Dated 21st August, 1861.*

2089. J. M. Murat, 51, Rue de Malte, Paris—Imp. in machinery or apparatus for shearing military hat tufts and other similar articles.

*Dated 24th August, 1861.*

2115. J. Driver, Keighley, and J. Jessop, Bradford, Yorkshire—Imp. in apparatus employed in washing, wringing, and mangling fabrics, and in the manufacture of part or parts of such apparatus.

*Dated 30th August, 1861.*

2157. A. J. Daumont, Paris—An improved umbrella.

*Dated 3rd September, 1861.*

2197. G. Bischof, Jun., Swansea—Imp. in extracting copper and silver from ores containing those metals. (Partly a com.)

*Dated 4th September, 1861.*

2203. F. E. Scheider, 13, Rue Gaillon, Paris—Imp. in cartridges for breech loading fire-arms, and in the machinery for manufacturing the same.

*Dated 6th September, 1861.*

2230. J. J. Russell, Wednesbury—Imp. in preparing the ends of welded tubes previous to their being fixed in plates.

2232. W. Wild, Bury—Certain imp. in machinery or apparatus to be employed in the preparation of cotton and other fibrous materials for spinning, called "Stubbing frames and roving frames."

*Dated 7th September, 1861.*

2240. G. Norris, Brondesbury-terrace, Kilburn—Imp. in the manufacture of soap.

*Dated 9th September, 1861.*

2248. P. B. O'Neill, Hart-street, Bloomsbury—Imp. in screw wrenches or spanners.

2250. J. H. Johnson, 47, Lincoln's-inn-fields—Imp. in fire grates and furnaces for domestic and other purposes. (A com.)

2251. W. E. Newton, 66, Chancery-lane—An imp. in the construction of boots and shoes. (A com.)

*Dated 11th September, 1861.*

2258. L. P. Barré, 4, South-street, Finsbury—Imp. in tubular steam boilers.

2260. W. L. Thomas, Hill-street, Berkeley-square—Imp. in projectiles.

*Dated 12th September, 1861.*

2264. W. Stephens, Godolphin-road, Hammersmith—Imp. in mechanism or apparatus for ploughing and cultivating the land by steam and other power.

2265. C. Greaves, Old Ford, Bow—Imp. in apparatus for preventing waste of water from service pipes or cisterns.

2266. A. Turner, Leicester—Improved apparatus for enabling the guards and drivers of railway trains to communicate with each other.

2269. W. W. Clay, Nottingham—Imp. in knitting machinery.

2270. W. E. Gedge, 11, Wellington-street, Strand—Imp. in the nautical compass. (A com.)

*Dated 13th September, 1861.*

2271. J. Oliver, Longtown, Cumberland—Improved machinery for making bricks, pipes, and tiles.

2273. W. Farlar, Turnham-green—Imp. in sash fastenings, which imps. are also applicable to other purposes.

2279. R. A. Brooman, 166, Fleet-street—Imp. in machines for weighing and measuring corn and other grain. (A com.)

2281. J. B. Howell, Sheffield—Imp. in the manufacture of chains and chain cables.

*Dated 14th September, 1861.*

2285. G. Dixon, Wood-street—Imp. in the manufacture of upholsterer's trimmings.

2287. W. H. Crispin, Marsh-gate-lane, Stratford, Essex—Imp. in the manufacture of curved and angular paper tubes and pipes.

2291. J. King and J. Sutcliffe, Rochdale—Certain imp. in or applicable to machines for spinning and doubling.

2295. H. C. Jennings, Great Tower-street—Imp. in treating hides and skins.

2297. W. E. Newton, 66, Chancery-lane—Improved apparatus to be adapted to carriages for the purpose of checking or arresting their progress on inclines or when going down hill. (A com.)

2299. T. Webb, Artillery-terrace, Victoria-street, Westminster—Imp. in tills or receptacles for money.

*Dated 16th September, 1861.*

2301. M. Rae, Manchester—Imp. in lamps.

2303. J. Reeves, New York, U.S.—Imp. in electro-magnetic engines for obtaining and applying motive power.

2305. W. J. Hesketh and D. Parsell, Saundersfoot, Pembrokeshire—Imp. in steam boilers and furnaces whereby better to adapt them to burn all kinds of coal, more especially anthracite or stone coal.

2311. R. A. Brooman, 166, Fleet-street—An imp. in shirts. (A com.)

*Dated 17th September, 1861.*

2315. F. Wrigley, Manchester—Imp. in the construction, manufacture, and mode of securing armour for the protection of ships and fortifications against projectiles.

2319. G. Davies, 1, Serle-street, Lincoln's-inn—Imp. in machinery or apparatus for the manufacture of horse-shoe and other nails. (A com.)

2321. J. Lee and B. D. Taplin, Lincoln—Imp. in traction engines.

#### INVENTIONS WITH COMPLETE SPECIFICATIONS FILED.

2222. M. A. F. Mennons, 39, Rue de l'Echiquier, Paris—Imp. in smoke-consuming furnaces. (A com.)—6th Sept., 1861.

2228. E. J. Hughes, 123, Chancery-lane, London—Imp. in watches. (A com.)—6th September, 1861.

#### PATENTS SEALED.

[From Gazette, September 27th, 1861.]

<i>September 26th.</i>	
597. J. Bunnett.	821. T. Wright and H. Wright.
762. W. Jeffs and J. Pennock.	836. D. Stone and C. Comer, Jun.
772. J. Bremner.	868. W. H. Beddall.
774. J. C. Keen.	876. F. Taylor.
775. L. J. Vandecasteele.	889. J. Shand and S. Mason.
777. R. A. Brooman.	892. T. Don, T. Smith, and L. Horsfield.
778. W. Sorrell.	893. C. Stevens.
779. W. Stratford.	949. C. Stevener.
780. G. M. Coppo.	1009. E. H. Benthall.
785. T. Sykes and B. C. Sykes, M.D.	1010. E. H. Benthall.
786. John Cass.	1027. E. H. Benthall.
787. G. Barton and E. Soar.	1050. J. H. Brown.
792. H. Medlock.	1076. W. E. Newton.
800. R. Searle.	1492. J. D. Harding and W. H. Winsor.
809. J. G. Winton and T. W. Cowan.	1650. T. Swinnerton.
810. J. H. Winder.	1676. S. H. Gerstle.
813. A. Huray and H. Leilé.	1781. W. Rigby.
816. J. Sickels.	1857. W. M. Cranston.

#### PATENTS ON WHICH THE STAMP DUTY OF £50 HAS BEEN PAID.

[From Gazette, September 27th, 1861.]

<i>September 23rd.</i>	
2195. H. Monier.	2181. A. Normand.
2261. J. L. Hancock and F. L. Hancock.	2344. R. Kennedy and J. Armstrong.
<i>September 24th.</i>	
2156. C. Hall.	<i>September 23rd (not produced).</i>
	2141. J. Wilson.

[From Gazette, October 2nd, 1861.]

<i>September 28th.</i>	
2173. T. Britt.	2183. J. J. Russell.
	2190. T. Preston.

#### PATENTS ON WHICH THE STAMP DUTY OF £100 HAS BEEN PAID.

[From Gazette, September 27th, 1861.]

<i>September 25th.</i>	
2070. T. Clayton and R. Harrop.	